

WHAT IS CLAIMED IS:

1. A polishing pad comprising a body having (a) a top surface comprising a first set of grooves with a first depth and first width and (b) a bottom surface comprising a second set of grooves with a second depth and second width, wherein the first set of grooves and second set of grooves are interconnected and are oriented such that they are not aligned.
2. The polishing pad of claim 1, wherein the first and second sets of grooves have a cross-sectional shape selected from the group consisting of lines, curves, circles, ovals, squares, rectangles, triangles, diamonds, and combinations thereof.
3. The polishing pad of claim 2, wherein the grooves are linear grooves.
4. The polishing pad of claim 3, wherein the first and second sets of grooves are non-parallel.
5. The polishing pad of claim 1, wherein the polishing pad has a void volume of about 30% or more.
6. The polishing pad of claim 5, wherein the polishing pad has a void volume of about 70% or more.
7. The polishing pad of claim 1, wherein the first set of grooves is rotated by an angle of about 10° to about 90° relative to the second set of grooves.
8. The polishing pad of claim 7, wherein the angle is about 90°.
9. The polishing pad of claim 1, wherein a first depth of the first set of grooves and a second depth of the second set of grooves combine to have a total groove depth that is about equal to or greater than the thickness of the polishing pad.
10. The polishing pad of claim 9, wherein the first set of grooves and second set of grooves are interconnected by primary channels that are oriented perpendicular to the top surface of the polishing pad.
11. The polishing pad of claim 10, further comprising a plurality of secondary channels extending through the thickness of the polishing pad.

12. The polishing pad of claim 1, wherein a first groove depth of the first set of grooves and a second groove depth of the second set of grooves combine to have a total groove depth that is less than the thickness of the polishing pad.

13. The polishing pad of claim 12, wherein the first and second sets of grooves are interconnected by a plurality of secondary channels extending through the thickness of the polishing pad.

14. The polishing pad of claim 1, wherein the first set of grooves, the second set of grooves, or a combination thereof have an average groove width of about 0.1 mm to about 2 mm.

15. The polishing pad of claim 1, wherein the first groove width and the second groove width increase from one side of the polishing pad to the other side of the polishing pad.

16. The polishing pad of claim 1, wherein the body comprises a polymer resin selected from the group consisting of thermoplastic elastomers, thermoplastic polyurethanes, thermoplastic polyolefins, polycarbonates, polyvinylalcohols, nylons, elastomeric rubbers, elastomeric polyethylenes, polytetrafluoroethylenes, polyethyleneterephthalates, polyimides, polyaramides, polyarylenes, polyacrylates, polystyrenes, polymethylmethacrylates, copolymers thereof, and mixtures thereof.

17. The polishing pad of claim 16, wherein the polymer resin is a thermoplastic polyurethane resin.

18. The polishing pad of claim 1, wherein the body of the polishing pad further comprises abrasive particles.

19. The polishing pad of claim 1, wherein the polishing pad is conductive.

20. The polishing pad of claim 19, wherein the body of the polishing pad further comprises conductive elements.

21. The polishing pad of claim 19, wherein the body of the polishing pad further comprises a conductive polymer.

22. A method of polishing a substrate by electrochemical-mechanical polishing comprising:

- (i) providing an electrochemical-mechanical polishing (ECMP) apparatus comprising the polishing pad of claim 1,
- (ii) providing a substrate to be polished
- (iii) supplying the ECMP apparatus with an electrolytically conductive fluid,
- (iv) applying an electrochemical potential to a surface of the substrate, and
- (v) moving the polishing pad relative to the substrate to abrade the substrate and thereby polish the substrate.

23. The method of claim 22, wherein the electrochemical potential is varied over time.

24. The method of claim 22, wherein the electrolytically conductive fluid is supplied by one or more pumps.

25. The method of claim 22, wherein the electrolytically conductive fluid comprises gas bubbles.

26. The method of claim 22, wherein the polishing pad is conductive.